

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000516110019-7

ACCESSION NR: AT4007032

ENCLOSURE 07



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CIA-RDP86-00513R000516110019-7"

L 8768-55

ACCESSION NR: AT40001017

ENCLOSURE

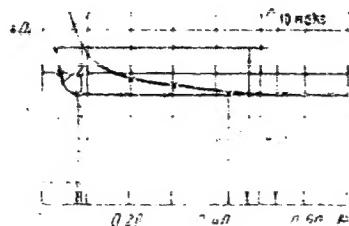


Fig. 3. Distribution of microhardness (amount of oxygen) with depth  
in the material used in the analysis of the crater of the impact.

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CIA-RDP86-00513R000516110019-7"

L 39050-66 ENT(m)/T/ENP(t)/ETI IJP(c) JD/WB

ACC NR: AP6020917 (A) SOURCE CODE: UR/0369/66/002/002/0200/0203

AUTHOR: Gorbunov, S. A.; Korolev, N. V.; Tikhomirov, V. I. 5/

ORG: Leningrad State University im. A. A. Zhdanov (Leningradskiy gosudarstvennyy universitet)

TITLE: Participation of nitrogen in the oxidation of titanium in air at high temperatures

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 2, 1966, 200-203

TOPIC TAGS: nitrogen, titanium, metal oxidation, high temperature oxidation

ABSTRACT: The main purpose of the work was to determine nitrogen directly in the surface layer of specimens of VT1 titanium alloy oxidized in air at 800-1200°, using spectral analysis and microhardness measurements. The surface gas-saturated layer on specimens oxidized at 1100-1200° was found to have a high nitrogen content (up to 3%). The main cause of the enrichment of the metal surface layer with nitrogen following oxidation in air at 1100-1200° is thought to be the reaction of titanium with atmospheric nitrogen. No pure nitride compounds are formed; the surface consists of a complex interstitial solid solution of oxygen, nitrogen, and partially carbon in  $\alpha$ -titanium. This is due to the characteristics of the structure  $\alpha$ -Ti, which has octahedral voids of large size. The participation of atmospheric nitrogen in the oxidation of titanium at high temperatures affects the entire oxidation process. Orig. art. has: 1 figure and

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L 39050-26

• ACC NR: AP6020917

1 table.

SUB CODE: 11/ SUBM DATE: 07Oct65/ ORIG REF: 010/ OTH REF: 003

Card 2/2 MLP

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**CIA-RDP86-00513R000516110019-7"**

22693

S/126/61/000/003/001/008  
A054/A127

18.1150

AUTHORS: Gorbunov, S. F., and Levitan, M. M.

TITLE: Production of cupola magnesium iron

PERIODICAL: Liteynoye proizvodstvo, no. 3, 1961, 1 - 4

TEXT: Magnesium-modified iron products are now used on a large scale (e. g. cast automobile and tractor crankshafts, wheels, hubs, fittings, radiator nipples, high-voltage power transmission line equipment etc.). Demands of the industries, however, are not met by present foundry production methods and simplified and more efficient and economical production methods are postulated. At the NAMI Institute, a simplified technology for the fabrication of ferritic and pearlitic magnesium cast iron has been developed. It is based on the modification of cast iron with a sulphur content of 0.01 - 0.03%, melted in a cupola furnace with basic lining and the modification of cast iron with a iron-silicon-magnesium master alloy of increased specific weight. This alloy may be directly put into the ladle without any violent reaction and spattering of metal. No special devices were necessary. In the heat treatment process of ferritic and pearlitic

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Production of cupola magnesium iron

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magnesium iron castings, carried out at 650 - 750°C, the first graphitization phase during annealing and other high-temperature treatment phenomena have been eliminated. A temperature of 1,350 - 1,400°C proved to be sufficient for various types of magnesium castings with a thickness of walls from 5 mm and above, including cast iron grades with ferritic structure of great plasticity. It was established that the latter could replace malleable iron and pearlitic cast iron of great strength and great resistance to wear in the fabrication of crankshafts for automobiles, which now could be cast. Additional modification for a large nomenclature of products by means of ferrosilicon, brand Cw75 (Si75) has been used to avoid the primary formation of cementite in castings of any cross-section. The amount of ferrosilicon introduced into the liquid metal ranged between 0.1 - 0.5%, depending on the grade of cast iron and the cross-section of the casting. Test melting was carried out in a cupola furnace with the following specifications: one row of tuyeres with no heating of the blast; diameter of the charge: 700 mm; useful height of the furnace shaft: 3,600 mm; height of the hearth: 380 mm; ratio of the total surface of outlet openings divided by the cross-section surface of the shaft: 25%; height of the idle charge

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Production of cupola magnesium iron

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from the tuyeres: 1,100 mm; weight of the metal charge: 300 kg; blast pressure: 500 - 560 mm. At a height of 1.8 m from the bottom lining was made from 2 layers. For the lining of the furnace shaft 4 layers have been used: firebricks, magnesite bricks, magnesite mass and clay. Magnesite bricks proved to be more suitable since use of chromium-magnesite bricks lead to a saturation of the cast iron with chromium up to 0.8%. Linings of this type sustained 5 - 7 heats, each of those lasting 2 - 4 hrs. The cast iron grades used in the melts were ЛК-3 (LK-3) and ЛК-4 (LK-4) plus gray cast iron risers. The flux material consisted of limestone, fluorite, manganese ore and dolomite. The most efficient flux combination proved to be a mixture of limestone and manganese-limestone, making 9 - 10% of the metal charge to ensure a minimum sulphur content of 0.015 - 0.025%. Adequate thickness of the slag layer is required for the same purpose. Modification according to the method of treating liquid metal with a low-percentage Fe-Si-Mn master alloy was performed in open, tee-pot shaped ladles with a capacity of 500 - 700 kg. To obtain magnesium cast iron of the required purity and to be able to remove the black spots, modification should also be performed in ladles with no smaller capacity than 400 - 500 kg. The amount of master alloy with a temperature of the cast iron on the spout was 1.8 -

X

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Production of cupola magnesium iron

2.0% of the weight of the liquid metal. The best method to prepare a suitable magnesium master alloy was the dissolution of solid magnesium in 75% ferrosilicon. It contained 5 - 7% Mg, 40 - 45% Si and iron. A preheated ladle was charged with magnesium billets, preheated up to 200 - 300°C, soft steel waste was added and finally the ladle was filled with liquid ferrosilicon type Si75 and heated up to 1,400 - 1,450°C. For the ferritic and pearlitic magnesium cast iron specimens high carbon content was considered to be of importance to obtain easier adsorption of Mg. Structural variants were achieved by different doses of ferrosilicon. The following composition has been selected, e. g. for the fabrication of cast crankshafts of pearlitic magnesium cast iron for the "Zaporozhets" and "Moskvich" automobiles: 3.4 - 3.6% C; 2.4 - 2.6% Si; 1.2 - 1.4% Mn; 0.15% P; 0.20% Cr; 0.007 - 0.015% S; 0.08 - 0.05% Mg. To eliminate certain difficulties in this technology due to the high liquidity and tendency to form shrinkage flaws, special gating systems and tapping temperatures have to be used (e. g. 1,270 - 2,310°C considered as sufficient for automobile hubs, wheels, oil pans, fittings etc.). Hubs of automobile wheels, hubs of truck trailers, automobile power transmission crankcases, radiator nipples, high-voltage insulators

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Production of cupola magnesium iron

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and other parts and components, previously made from malleable iron, were produced from ferritic magnesium cast iron. The automobile parts were intended for the ZIL-type, while for the "Zaporozhets 965B" and the "Moskvich 407" type cast crankshaft were made from pearlitic magnesium iron. Casting was done in vertical molds whereby welding of crankpins and counterweights was simplified and performed with high precision. Essential in this casting technology is the use of a dry slag skimmer with centrifugal action. In the first attempts of making cast crankshafts for the "Zaporozhets" car, sufficient purity of the metal and a minimum of black inclusions has been achieved. A party of 300 crankshafts was produced. They were tested in automobile engines and then adopted for actual operation. The making of such castings without structurally free cementite helps to considerably cut down the heat treatment cycle due to the elimination of the first graphitization phase and heat treatment of ferritic magnesium iron was carried out at 720°C - 750°C over a period of 3 - 4 hrs with subsequent air-cooling of the castings. In a similar manner radiator nipples have been annealed. Pearlitic magnesium parts, including cast crankshafts were annealed at 640 - 660°C over a period of 2 - 3 hrs and cooled by air. The main mechanical properties characteristics of heat-treated ferritic and pearlitic magnesium iron are given in Table 2. There are 7 figures, 2 tables and 1 Soviet-bloc reference.

Card 5/6

LEVITAN, M.M.; GORBUNOV, S.F.

Heat treatment and properties of cast crankshafts. Lit. proizv.  
no.12:13-16 D '64. (MIRA 18:3)

3(5) PLATE I BOOK EXPLORATION  
SOV/2905

Akademicheskayi Izdatel'stvo Akademii Nauk SSSR. Sovet po zemlenahru prosvetitel'nykh

Prilozheniya resursov Gruzinskoy SSR. t. 2: Neometallicheskye polozhnye resursy (Natural Resources of the Georgian Soviet Socialist Republic). v. 2: Neometallicheskie mineral'nye depozity. Moscow, Izd-vo AN SSSR, 1959. 379 p. Errata slip inserted. 5,500 copies printed.

Ed.: P.M. Tsvetadze, Corresponding Member, Gruzinskoy SSR Academy of Sciences; Ed. of Publishing House: K.N. Produtov; Tech. Ed.: R.I. Aglava; Sh. M. Archvedze, N.D. Vashnadze, G.G. Ovashvili; R.I. Aglava, Sh. M. Archvedze, N.D. Vashnadze, G.G. Ovashvili, G.Y. Davitashvili, N.M. Katskhoveli, I.S. Mikheilashvili, N.K. Rabinashvili, A.V. Tsvetadze (Deceased), G.V. Tsvetadze, and P.G. Shengelia.

PURPOSE: This book is intended for economic geologists and mineralogists.

CONTENTS: This collection of articles describes the nonmetallic mineral deposits of the Transcaucasian SSR and the extent to which they have been exploited. Individual articles discuss the importance of barite, dolomite, talc, andesite, and other minerals to the chemical industry; of barite, talc, andesite, and other minerals to the petroleum industry; and of marble, clastic, and bentonitic clays to the construction industry. A map depicting the major nonmetallic mineral deposits is included with this work. No personalities are mentioned. References accompany each article.

77 Glasnost' or Georgia

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GORBUNOV, V. Eng.

"Types of Jets for Flights at High Velocity"

P: Tekhnika Molodezhi, Aug. (1945) Moscow

Soviet Source: Abstracted in USAF "Treasure Island" Report No. 1045, on file in Library of Congress, Air Information Division.

GORBUNOV, V. (Khabarovsk).

Useful suggestion. Pozh.delo 3 no.8:3 Ag '57. (MLRA 10:8)  
(Electric power plants--Fires and fire prevention)

AUTHOR: Gorbunov, V. (Kazan') 29-3-23/25

TITLE: More Ideas and Initiative in the Work of the Komsomol (Bol'she vyдумки i initsiativy v komsomol'skoy rabote)

PERIODICAL: Tekhnika Molodezhi, 1958, Vol. 26, Nr 3, pp. 33-33 (USSR)

ABSTRACT: The author writes the following: There are 12 universities in our republic which are attended by 22 thousand students. The Komsomol-organizations support the instruction of young specialists. More than 3000 students participate at present in the work of scientific circles of investigation. It must, however, be pointed out that the universities still impart too little practical experience in the organization of industrial undertakings, technology and planning to the students. The instruction of young specialists remains behind the requirements of political economy. This was the reason why the Komsomolze of the universities searched for an expedient in view of bringing theory in closer contact with practice. Due to the initiative of the Komsomolze the Bureau of Testing and Construction was established as the Institute for Aviation in Kazan. This first trial met with approval and it was decided to widen it. The students of the Institute of Architecture were engaged for

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More Ideas and Initiative in the Work of the Komsomol

29-3-23/25

planning projects of economical importance. Such practical work enriches the knowledge and experiences of the future professional workers. The komsomol organization of the State University imeni V. I. Ul'yanov-Lenin at Kazan participated actively in the construction of a home. Working brigades were established at each faculty. Stonemasons and stuccoworkers joined these brigades. Lesha Kondrat'yev was appointed manager of this contracting firm. The dormitory was built up of first-class work within record time. There are sometimes complaints concerning the passivity of youth. Yet this is only the case where the leaders of the Komsomol do not take the trouble of finding interesting forms of work. Useful and practical activities always encourage youth.

AVAILABLE: Library of Congress

1. Study and teaching - USSR

Card 2/2

GORBUNOV, V., delegat XXI s"yezda Kommunisticheskoy partii Sovetskogo  
Soyuza, slesar'-sudomontazhnik

We are up to the tasks of the seven-year plan. Sov.profsoiuzy  
7 no.4:12-13 Fe '59. (MIRA 12:5)

1. Admiralteyskiy zavod.  
(Leningrad--Shipbuilding)

06412  
SOV/107-59-5-7/51

9(2)

AUTHORS: Gorbunov, V., Kamenev, L.  
TITLE: Radio-Electronics in the Chemical Industry  
PERIODICAL: Radio, 1959, Nr 5, p 5 (USSR)

ABSTRACT: Electronic instruments in combination with control devices find a wide-spread application in the chemical industry. As an example, the authors describe the electronic control processes used in aniline production. Further they mentioned the "Mars-200" electronic computer which controls the production of the Yefremovskiy zavod sinteticheskogo kauchuka (Yefremov Synthetic Rubber Plant). It is expected that a "Mars-200" computer will be installed also at the plant "Krasnyy bogatyr'" resulting in an annual saving of 5 million rubles. There is 1 block diagram.

Card 1/1

PLOTNIKOV, A., kand.tekhn.nauk; GORBUNOV, V., inzh.

Turbocompressor unit of 480000 Nkcal/hr refrigerating capacity  
[with summary in English]. Khokh. 37 no.2;13-17 My-Ap'60.  
(MIRA 13:10)

(Refrigeration and refrigerating machinery) (Air compressors)

GORBUNOV, V.

Increasing the efficiency of industrial equipment. NTO 2  
no.4:18-19 Ap '60. (MIRA 13:6)

1. Glavnyy inzhener Ul'yanovskogo zavoda malolitrazhnykh  
dvigateley, chlen soveta pervichnoy organizatsii Nauchno-  
tekhnicheskogo obshchestva.  
(Ul'yanovsk—Gas and oil engines)

GORBUNOV, V., inzh.

Sack cleaning machine of the ZMM brand. Muk.-elev. prom. 29  
no.7:25-26 J1 '63. (MIRA 17:1)

1. Gor'kovskaya mashinoispytatel'naya stantsiya.

OVODOV, Yu. (UA6AJ); IVANKOVICH, A. (UW3DS); GORBUNOV, V. (UA9YC)

Ultrashort radio waves. Radio no.7:17 '64.

(MIRA 18:1)

1. Predsedatel' sektsii korotkikh voln i ul'trakorotkikh voln,  
Armvir (for Ovodov).

L 01924-67 ARG/EWT(d)/FBO/EWP(c)/EWP(h) DE/~~MM~~  
ACC NR: AP6030908 SOURCE CODE: UR/0209/66/000/009/0031/0033

AUTHOR: Gorbunov, V. (Engineer; Lieutenant colonel)

65

ORG: none

13

B

TITLE: Increase of missile preservation in depots

SOURCE: Aviatsiya i kosmonavtika, no. 9, 1966, 31-33

TOPIC TAGS: guided missile, missile reliability, equipment preservation technique

ABSTRACT: The author discusses the need for increasing the reliability of preservation of various types of guided missiles by trained personnel of the air force. Preservation techniques for more economical storage in missile depots are analyzed in detail and various shortcomings are discussed.

[NT]

SUB CODE: 15/ SUBM DATE: none/

Card 1/1 hs

GORBUNOV, V.

There is no proper responsibility. Fin. SSSR 23 no.10:78 0 '62.  
(MIRA 15:10)

1. Starshiy inspektor gosudarstvennykh dokhodov Kalininskogo  
rayonnogo finansovogo otdela Kalininskoy oblasti.  
(Kalinin Province—Cooperative societies—Auditing and inspection)

MALOVA, M.; GORBUNOV, V.

Expansion of the movement for communist labor among inland trans-  
portation workers of Siberia and the Far East. Rech. transp. 20  
no.9:2-3 S '61. (MIRA 14:9)  
(Inland water transportation--Employees)  
(Socialist competition)

GORBUNOV, V., inzh.

Barge operations without crews! Rech. transp. 21 no.9:11  
S '62. (MIRA 15:9)  
(Barges) (Towing)

GORBUNOV, Valeriy Arkad'yevich; POLYAKOVA, N., red.; KLIMOVA, T., tekhn.  
red.

[For the honor of the trademark] Za chest' zavodskoi marki. Moskva,  
Gos. izd-vo polit. lit-ry, 1961. 45 p. (MIRA 14:11)  
(Quality control)

GORBUNOV, Valeriy Arkad'yevich; BOGDANOVA, N., red.; YAKOVLEVA, Ye.,  
tekhn. red.

[Patriotic initiative of Moscovites; struggle for the improvement of the quality and durability of industrial products] Patrioticeskii pochin moskviche; borot'sia za povyshenie kachestva i nadezhnosti promyshlennoi produktsii. Moskva, Mosk. rabochii, 1961. 66 p.

(MIRA 15:1)

(Moscow—Socialist competition)  
(Moscow—Quality control)

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Pac-4 WR

PSS-2/EEG-2/ENT(1)/FEC(t)/EED-2 Pm-4/Pn-4/Pi-4/Pj-4/Pk-4/Pt-4/

AM5003724

BOOK EXPLOITATION

S/

REFERENCE: ANALYSIS OF THE BOOK EXPLOITATION

TOP SECRET: detection system, optical detection, radio reconnaissance, laser detection

**PURPOSE AND COVERAGE:** This book was written for army and navy officers, academy and college students, and specialists in civil aviation, the navy, and the marine engineering. The book is intended for the application and development of aircraft engineering and naval engineering. The book is intended for the application and development of aircraft engineering and naval engineering.

Card 1/3

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reconnaissance in solving the problem of search for and detection of targets are presented in the book, and methods of determining the required quantitative characteristics of the reconnaissance capability of target-detection means under different conditions of search are analyzed.

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Ch. II. Characteristics of instantaneous probability of target detection	10
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SIR CORD: NO

OTHER: NO

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L 41182-65 EWT(d)/EWP(c)/EWP(v)/T/EWP(k)/EWP(1) PF-4  
ACCESSION NR: AP5004677 S/0115/64/000/009/0058/0059

70

AUTHORS: none

18

B

TITLE: Fourth scientific and technical conference on "Cybernetics for the improvement of measurement and inspection methods"

SOURCE: Izmeritel'naya tekhnika, no. 9, 1964, 58-59

TOPIC TAGS: cybernetics, electric measurement, electric quantity instrument, digital computer, electronic equipment, electric engineering conference

ABSTRACT: The conference was held 1-4 July at the All-Union Scientific Research Institute of Metrology by the Section of Electrical Measurements of the Council on the Problem of "Scientific Instrument Making" of the State Committee on Coordination of Scientific Research Work in the USSR together with the All-Union Scientific Research Institute of Electrical Measurement Instruments and the Leningrad Regional Administration of the Scientific and Technical Division of the Instrument Making Industry. More than 400 delegates from 29 cities of the country participated.

Fifty-seven reports were heard and discussed. Reports were given by: P. V. NOVITSKIY (Leningrad)--"Definition of the Concept of Informational Error in Measurement and its Importance in Practical Use" and "On the Problem of the Average Informational Criterion of Accuracy Throughout the Entire Scale of an Instrument"; Ya. A. Card 1/4

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KUPERSHMDT (Moscow)--"On Determination of the Criteria of Accuracy for Measurement Devices"; S. M. MANDEL'SHTAM (Leningrad)--report on a new criterion of accuracy of measurement instruments; P. F. PARSHIN (Leningrad)--report on optimization when using Fourier transforms on electronic digital computers; S. P. DMITRIYEV, G. Ya. DOLOINTSEVA and A. A. IGNATOV (Leningrad)--proposal of a new method for solving problems of optimum filtering for non-stationary random signals and interference; I. B. CHELPAKOV--"Calculation of the Dynamic Characteristics of an Optimum Complex Two-Channel System which Uses Signals from a Position Meter and from a Speed Meter"; R. A. POLUSKTOV (Leningrad)--"Optimum Periodic Correction in the Measurement of Continuous Signals"; S. P. ADANOVICH (Moscow)--"Analysis and Construction of Devices for Correction of Non-linearity and Scaling for Unitary Codes"; G. V. GORELOVA (Taganrog)--"A Method for Statistical Optimization in Graduating the Scales of Electrical Measuring Instruments"; M. A. ZEMEL'MAN (Moscow)--"Analog-Digital Voltage Convertor with Automatic Error Correction"; B. N. MALINOVSKIY, V. S. KALENCHUK and I. A. YANOVICH (Kiev)--"Automatic Monitoring of the Parameters of the Electrical Signals of Complex Radio and Electronic Equipment"; V. P. PEROV (Moscow)--"Operational Cybernetics as an Independent Scientific Specialization"; Ye. N. GIL'BO (Leningrad)--"On the Problem of Effective Non-linear Scales"; A. I. MARKELOV (Moscow)--"Devices for Preliminary Processing of the Results of Measurements Presented in the Form of"

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ACCESSION NR: AP5004677

Graphic Recordings For Subsequent Introduction of the Information into Universal  
Digital Computers"; O. M. NOGILEVER and S. S. SOKOLOV (Leningrad)--"On a Method for  
Reducing Excess Information"; T. V. NIKOLAYEVA (Leningrad)--"A Device for Temporal  
Discretization of Continuous Signals"; A. A. LYOVIN and M. L. BULIS (Moscow)--  
"Optimization of the Transmission of Telemetric Information as a Means for Raising  
the Efficiency and Eliminating Interference"; D. E. GUKOVSKIY (Moscow)--"On a Sta-  
(Leningrad)--"Method for Calculating the Holding Time of Communications in a Contra-  
lized Inspection System or Constant Servicing Time"; O. N. BRONSHTEYN, A. L. RAYKIN  
and V. V. RYKOV (Moscow)--"On a Single-Line Mass Service System with Losses"; V. M.  
SHLYANDIN (Penza)--report on circuit designs for direct compensation electrical  
digital measuring instruments; A. N. KOMOV (Novocherkassk)--report on a new method  
for compensation of digital bridges; M. N. GLAZOV (Leningrad)--report on the problem  
of voltage-to-angular rotation conversion; V. S. GUTNIKOV (Leningrad)--"Methods for  
Construction of Frequency Capacitance Pickup with a Linear Scale"; R. Ya.  
SYROPYATOVA and R. R. KHARCHENKO (Moscow)--report on the determination of the ampli-  
(Novocherkassk)--"The Phototransistor as a Switch for Electrical Measurement  
, Purposes"; N. V. MALYGINA (Leningrad)--a report on ways for making universal equip-  
ment for measurement of current, voltage and power; P. P. ORNATSKIY and V. I.  
ZOZULYA (Kiev)--reports on the construction of static voltmeters, wattmeters and

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phase meters; A. V. TRIKHANOV, I. G. SINYASHLYAYEV, N. I. SABLIN, V. M. RAZIN and V. A. GORBUNOV (Tomsk)--report on a device for automatic processing of the measurements of vibration amplitude of pneumatic hammers; L. K. RUKINA and V. G. KNORRING (Leningrad)--report on the development of a digital compensator for measuring pressure, force, etc.; N. B. DADUKINA (Leningrad)--report on a method for constructing frequency pickups for gas analysis; Ye. M. KARPOV, V. A. BRAZHNICKOV and B. Ya. LIKHITTSINDER (Kuybyshev)--reports on analysis and recording of boring speeds; Yu. V. PSHENICHNIKOV (Kuybyshev)--"A High Speed Voltage-to-Digital Code Converter for no Pickups"; G. P. VIKHROV and V. K. ISAYEV (Vilna)--"A Highly Accurate Digital Peak-to-Peak Voltmeter"; and S. M. PERSIN (Leningrad)--"A Low Level Analog-Digital Voltage Converter."

ASSOCIATIONS: none

SUBMITTED: 00

ENCL: 00

SUB CODES: EE, ED

NO REF Sov: 000

OTHER: 000

JPRS

*me*  
Card 4/4

GORBUKOV, V.A., kand. tehnicheskikh nauk, dozent, kapitan 1-go ranga

Methodology of constructing distribution graphs of the range of  
observation means. Nov. sber. 48 no.3:40-45 Mr 165.

(MIRA 18:6)

GORBUNOV, V.D.; DRUZHININ, I.G.

Solubility isotherm of aluminum sulfate in water. Izv. AN Kir.  
SSR. Ser. est. i tekhn. nauk 4 no. 9:93-99 '62. (MIRA 16:4)  
(Aluminum sulfate) (Solubility)

DRUZHININ, I.G.; GORBUNOV, V.D.

Solubility polytherm of the system aluminum sulfate - sodium sulfate - water at the temperature range from 10 to 95°C.  
Izv. AN Kir.SSR.Ser.est.i tekhn.nauk 4 no.9:111-121 '62.

(Aluminum sulfates) (Sodium sulfate) (Solubility)  
(MIRA 16:4)

BLESHINSKIY, S.V.; KHARAKOZ, A.Ye.; LUKIN, I.N.; BABENKO, V.G.; CHALOVA, Ye.P.; Prinimali uchastiye: ABRAMOVA, V.F.; VINOGRADOV, V.P.; USUBAKUNOV, M.; GOREBUNOV, V.D.; OSIPOVA, T.P.; NAGAYEVA, A.G.; MEDVEDEVA, V.A.; ALTYNNIKOVA, P.M.

Fluosilicic method for separating rare-earth elements. Izv. AN Kir. SSR. Ser. est. i tekhn. nauk 5 no.4:23-24 '63.

(MIRA 16:10)

BLESHINSKIY, S.V.; KHARAKOZ, A.Ye.; ABRAMOVA, V.F.; VINOGRADOV, V.P.;  
BAELENKO, V.T.; KACHKIMBAYEVA, S.A.; Prinimali uchastiye:  
USUBAKUNOV, M.; NAGAYEVA, A.G.; GORBUNOV, V.D.; MEDVEDEVA,  
V.A.; CHALOVA, Ye.P.; ALTYNNIKOVÄ, P.M.

Method for separating rare-earth elements based on the thermal  
dissociation of sulfates. Izv. AN Kir. SSR. Ser. est. i tekhn.  
nauk 5 no.4:25-26 '63. (MIRA 16:10)

17(

SOV/177-58-9-30/51

AUTHOR: Gorbunov, V.F., Senior Lieutenant of the Medical Corps

TITLE: Practice in the Complex Application of ASD f-3 Preparation in Epidermophytosis

PERIODICAL: Voyenno-meditsinskiy zhurnal, 1958, Nr 9, pp 79-80  
(USSR)

ABSTRACT: The ASD f-3 preparation, recommended for treating epidermophytosis in dispensaries and unit hospitals is applied with Lassar's paste and a 5 - 10% salicyl paste once or twice a day in the ratio 1:3. For the purpose of desensibilization, patients take a 10% solution of calcium chloride 3-4 times a day or intravenously 5 - 10 ml each, and vitamins C and B<sub>1</sub> three times a day. The mixture for prophylactic purposes is composed of formalin and zinc-oxide 6.0 each, talcum and glycerin 10.2 each in 2 to 3 cycles of three days each with an interval of one week between the cycles.

Card 1/1

GORDEUNOV, V.F., Cand Tech Sci-- (diss) "Experimental study of the ~~working~~ <sup>working</sup> process of pneumatic drilling-hammers." Tomsk, 1958. 12 pp  
(Min of Higher Education USSR. Tomsk Order of Labor Red Banner Polytech Inst im S.E.Kirov. Chair of Mining Machines and Ore Transport), 100 copies  
(KL,43-58, 116)

- 26 -

ALIMOV, O.D.; GORBUNOV, V.F.

Modern trends in the creation of highly efficient pneumatic  
bore-hammers. Izv. TPI 106:3-8 '58. (MIRA 11:11)  
(Rock drills--Pneumatic driving)

ALIMOV, O.P.; GORBUNOV, V.F.

Methods of experimental investigation of pneumatic bore-hammer operations. Izv. TPI 106:24-35 '58. (MIRA 11:11)  
(Rock drills--Pneumatic driving) (Cathode ray oscillosograph)  
(Boring--Testing)

ALIMOV, O.D.; GORBUNOV, V.P.

Investigating the operation of high speed bore-hammers with  
valveless air distribution. Izv. TPI 106:36-50 '58.

(MIRA 11:11)

(Rock drills--Pneumatic driving)

ALIMOV, O.D.; GORBUNOV, V.F., red.

[Study of the processes of breaking rocks in drilling holes]  
Issledovanie protsessov razrusheniia gornykh porod pri bu-  
renii shpurov. Tomsk, Izd-vo Tomskogo univ., 1960. 87 p.  
(MIRA 16:8)

(Boring) (Rocks--Testing)

ALLIMOV, Oleg Dmitriyevich; RASOV, Ivan Grigor'yevich; GORBUNOV, Valeriy  
Fedorovich; MALIKOV, Daitriy Nikiforovich; FEYGIN, I.M., otv.red.;  
ABARBARCHUK, P.I., red.izd-va; SHKLIAR, S.Ia., tekhn.red.

[Boring machines] Buril'nye mashiny. Moskva, Gos.nauchno-tekhn.  
izd-vo lit-ry po gornomu delu, 1960. 256 p.

(MIRA 14:2)

(Boring machinery)

*Gorbunov V.F.*

PHASE I BOOK EXPLOITATION

SOV/5156

Alimov, Oleg Dmitriyevich, Ivan Grigor'yevich Basov, Valeriy Fedorovich Gorbunov,  
and Dmitriy Nikiforovich Malikov

Buril'nyye mashiny (Boring Machinery) Moscow, Gosgortekhizdat, 1960. 256 p.  
Errata slip inserted. 5,300 copies printed.

Resp. Ed.: L.M. Feygin; Tech. Ed.: S.Ya. Shklyar; Ed. of Publishing House:  
F.I. Abarbarchuk.

**PURPOSE:** This book is intended for technical personnel concerned with the  
design and operation of boring machinery. It may also be used as a textbook  
by students at mining and civil-engineering schools of higher education.

**COVERAGE:** The authors describe modern mining equipment and discuss methods and  
results of investigating the operation and performance of pneumatic hammer  
drills, electric and pneumatic drills, rotary-percussive machines, and cross-  
cutting machines. New, highly efficient models of machines used for drilling  
blastholes and large-diameter wells are described and methods for their proper  
utilization are considered. The book is based on the results of investigations

*Carri-1/4-*

Boring Machinery

sov/5156

conducted by the authors in the Department of Mining Machinery and Ore Transportation of the Tomskiy politekhnicheskiy institut (TPI) (The Tomsk Polytechnical Institute). Some of this work was accomplished in cooperation with the technical personnel of the Tomskiy electromekhanicheskiy zavod im. Vakhrusheva (TEZ) (The Tomsk Electromechanical Plant imeni Vakhrushev), the mines of the kombinat Kuzbassugol' (Kuznetsk Basin Coal Combine), and the Kuznetskiy naučno-issledovatel'skiy ugol'nyy institut (KuzNIUI) (The Kuznetsk Scientific Research Coal Institute). The authors thank Ya.A. Serov and N.P. Ryashentsev, Candidates of Technical Sciences, L.T. Dvornikov, N.S. Kolodyazhnyy, and P.A. Samoylov, Teachers; A.R. Ayzenshteyn and A.P. Grishin, Engineers at the Tomsk Electromechanical Plant imeni Vakhrushev, and A.N. Volkov and N.A. Belan, Scientific Workers of the Kuznetsk Scientific Research Coal Institute. The authors also thank E.I. Lisovskiy, G.F. Van'shin, and V.V. Vasil'yev, Technicians of the Tomsk Polytechnical Institute, and Ye.I. Volodina, Ye.A. Okunev, and P.A. Tolstikov. There are 183 references: 169 Soviet 7 English, 6 German, and 1 French.

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Review of the book "Experimental studies on the processes of breaking rocks with blows" by L.I. Baron, G.M. Veselov, and Iu.G. Koniashin. Gor. zhur. no.7:80 Jl '63.

(MIRA 16:8)

1. Tomskiy politekhnicheskiy institut.

GORBUNOV, V.F., inzh.; KOPYTOV, V.I., inzh.; VYSOTSKIY, I.F., inzh.

Results of the investigation of a specimen of pneumatic  
drill with an elastic handle. Izv. vys. ucheb. zav.;  
mashinostr. no.10:54-57 '63. (MIRA 17:3)

1. Tomskiy politekhnicheskiy institut.

LAVRENCHIK, V.N.; SAMOYLOV, L.N.; CHULKOV, P.M.; GORBUNOV, V.F.;  
VEL'TISHCHEVA, N.S.

Air contamination by artificial radioactive substances over the  
Atlantic Ocean in 1961. Atom. energ. 14 no.6:569-572 Je '63.  
(MIRA 16:7)  
(Atlantic Ocean—Radioactive fallout)

GORBUNOV, V.F.; BABUROV, V.I.; OPARIN, Yu.A.; REDUTINSKIY, L.S.

Raising the efficiency of fettling operations. Lit. proizv. no.9:  
13-15 S '64. (MIRA 18:10)

GORBUNOV, V.F., kand. tekhn. nauk; BABUROV, V.I.

Evaluating the vibration of chopping and riveting hammers.  
Mashinostroitel' no.2:42-43 F '65. (MIRA 18:3)

GORBUKOV, V.G., kand. tekhn. nauk; RABUROV, V.I., inzh.; BLAGOVISHCHENSKIY, I.S.,  
inzh.

Experimental testing of the effect of the elastic properties of  
the material being drilled on the internal processes and para-  
meters of a manual pneumatic hammer. Izv. vys. ucheb. zav.; gor.  
zhur. 8 no.1:63-67 '65. (MIRA 18:3)

1. Tomskiy politekhnicheskiy institut. Rekomendovana kafedroy  
gornykh mashin i rudnichnogo transporta.

GORBUNOV, V.I.

Betatron devices for medical purposes. Med. prom. 16 no. 3:55-57 Mr  
'62/ (MIRA 15:5)

1. Tomskiy politekhnicheskiy institut imeni Kirova.  
(BETATRON) (MEDICAL INSTRUMENTS AND APPARATUS)

GORBUNOV, V.I., fel'dsher (selo Ul'durga Chitinskoy oblasti)

Compound treatment of lumbosacral radiculitis (Rosenthal's  
paste and vitamin therapy) at a medical and obstetrical  
station. Fel'd. i akush. 27 no.4:37-38 Ap '62. (MIRA 15:6)  
(OINTMENTS) (VITAMIN THERAPY)  
(NERVES, SPINAL—DISEASES)

BOGDASHIN, A.S.; BOGORODSKIY, A.A.; VINGARIT, M.B.; GORBUNOV, V.I.; GORBUNOV, V.R.; DUROV, V.K.; YERMAKOV, A.L.; IVANOV, A.A.; KARAKOVA, N.I.; KOBILYAKOV, L.M.; KOZLOVSKIY, N.I.; MARAKHTANOV, K.P.; MIRUMYAN, G.N.; NECHRTOV, G.P.; NOVIKOV, A.G.; OL'KHOVSKIY, K.I.; PASTRYAKOV, A.I.; POLAPANOV, A.V.; SKLYAREVSKAYA, Ye.Kh.; SOLDATENKOV, S.I.; SOROKIN, Ye.M.; TRUSHINA, Z.V.; FEDOROV, P.F.; FEDOSKOV, A.M.; FROG, N.P.; SHAMAYEV, G.P.; YANOVSKIY, V.Ya.; GREEKHOV, A.D., spetsred.; DEYEEVA, V.M., tekhn.red.

[Handbook on new agricultural machinery] Spravochnik po novoi tekhnike v sel'skom khoziaistve. Moskva, Gos.isd-vo sel'khoz. lit-ry, 1959. 364 p. (MIRA 13:2)  
(Agricultural machinery)

GOEBUNOV, V.I.

Machinery for cotton growing. Biul.tekh.-ekon.inform. no.11:  
61-64 '59. (MIRA 13:4)  
(Cotton machinery)

GORBUNOV, V.I., fel'dasher (selo Usugli Chitinskoy oblasti)

Hydatid mole. Fel'd i akush. 24 no. 2:22-25 Fe '59. (MIRA 12:3)  
(PREGNANCY, MOLAR)

KAGANOV, Z.G.; GORBUNOV, V.I.

Dielectric properties of dyed yarn at high frequencies. Izv.  
vys.ucheb.zav.; tekhn.tekst.prom. no.1:34-40 '59.

(MIRA 12:6)

1. Ivanovskiy tekstil'nyy institut, i Ivanovskiy melanzhevyy  
kombinat im. Frolova.  
(Yarn--Electric properties)

GORBUJOV, V.I.

New machines used in cotton growing. Biul. tekhn.-ekon. inform.  
no.8:59-63 '58. (MIRA 11:10)  
(Cotton machinery)

GORBACHEV, V.I., speech.

For a more efficient use of machinery in cotton growing. Trakt. i  
sel'cheskash. no.7:15-17 JI '82. (MIRA 12:11)  
(Cotton machinery)

GORBUNOV, V., inzh.

New cotton-picking machinery. Nauka i pered.op.v sel'khoz.  
9 no.9:60-62 S '59. (MIRA 13:2)  
(Cotton-picking machinery)

GORBUKOV, V.I.; POKROVSKIY, A.V.

Highly efficient betatron defectoscope with scintillation counters for the control of thick welded joints. Defektroskopija no. 5-38-44 '65 (MIRA 1961)

1. Tomskiy politekhnicheskiy institut.

I : 28168-66 EMT(d)/EMT(n)/EPF(n)-2/EMP(c)/EMP(v)/T/EMP(k)/EMP(l)/EWA(h)/ETC(m)-6

ACC NR: AP6010272 IJP(c) (N) SOURCE CODE: UR/0381/66/000/001/0035/0039

AUTHOR: Gorbunov, V. I.; Pekarskiy, G. Sh.

ORG: Tomsk Polytechnic Institute im. S. M. Kirov (Tomskiy politekhnicheskiy institut)

TITLE: Flaw detection in extra-thick heavy metals with the aid of fast neutrons

SOURCE: Defektoskopiya, no. 1, 1966, 35-39

TOPIC TAGS: flaw detection, neutron detection, heavy nucleus, lead, fast neutron, scattering cross section

ABSTRACT: The passage of neutrons through matter is a complicated process, but for heavy nuclei in the neutron energy range 1-14 Mev the total interaction cross-section consists chiefly of elastic and inelastic scattering cross-sections. In elastic interaction between a fast neutron and a heavy nucleus center-of-mass motion may be disregarded and the scattering may be considered isotropic in a laboratory coordinate system. Since for heavy nuclei the mean logarithmic energy losses per collision are extremely small, e.g. 0.0096 for lead as compared with 0.158 for carbon, the retardation of fast neutrons owing to elastic scattering is insignificant. In inelastic scattering, owing to a unitary interaction, the bulk of neutrons passes over to the energy range  $\ll E$ . In this range the process of elastic scattering, which occurs nearly without any energy loss, predominates. Therefore, an accumulation of low-

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UDC: 629.179.15

I 28468-66

ACC NR: AP6010272

-energy neutrons with a high penetrating power is observed in the neutron flux following its passage through a heavy-metal absorber. In this connection, on the basis of an experimental investigation of the transformation of the neutron spectrum of a Po-Be source it is shown that fast neutrons can be successfully utilized for flaw detection in extra-thick (300-600 mm) lead. (discrimination level 3 Mev, collimation slit diameter 3 m, signal/noise ratio = 2). Flaw detection in heavy metals of such thickness with the aid of other radiation methods (Xrays, isotope  $\gamma$ -rays, etc.) is not feasible, since a 300-mm thickness of lead corresponds to a  $10^8$ -fold attenuation of the bremsstrahlung of a betatron with a maximum energy of 30 Mev. An examination of the energy dependence of the inelastic scattering cross-section for other heavy elements (Pasechnik, M. V. Voprosy neytronnoy fiziki srednykh energiy. Kiev. Izd. AN UkrSSR, 1962) shows that they too can be inspected for flaws by neutron radiography. The selection of the right radiation source is important; since the inelastic interaction cross-section for various materials reaches its maximum in the 3-6 Mev region, this region should represent the lower energy boundary of the source used. In addition, in view of the considerable effect of the registrable contribution of inelastically scattered neutrons on the sensitivity of the flaw finder, the discrimination threshold of the recorder must be above the energy corresponding to the maximum in the Maxwell distribution of inelastically scattered electrons. Orig. art. has: 5 figures, 5 formulas.

SUB CODE: 13, 11, 20, 18/ SUBM DATE: 29Jul65/ ORIG REF: 009/ OTH REF: 004

Card 2/2 *xc*

L 32702-66 EWT(d)/EWT(m)/EWP(c)/EWP(v)/T/EWP(k)/EWP(l) IJP(c)  
ACC NR: AP6014423 (N) SOURCE CODE: UR/0381/65/000/005/0038/0044

AUTHORS: Gorbunov, V. I.; Pokrovskiy, A. V.

ORG: Tomsk Polytechnic Institute (Tomskiy politekhnicheskiy institut)

TITLE: High-duty betatron flaw detector with scintillation counters for control of  
welded joints of great thickness

SOURCE: Defektoskopiya, no. 5, 1965, 38-44

TOPIC TAGS: betatron, welding inspection, welding, flaw detector

ABSTRACT: A high-duty betatron flaw detector equipped with scintillation counters for detection of defects in welded joints of up to 400 mm thickness is described. The scanning speed of the apparatus is 1000—1500 cm<sup>2</sup>/min with a sensitivity of 1% of the total thickness of the material under test. A schematic of the installation is presented (see Fig. 1). An appraisal of different detector schemes was also carried out. The experimental results are presented in graphs and tables (see Fig. 2). It is concluded that the apparatus (with suitable modifications) may be successfully employed for the detection of defects in less dense and also more dense materials than steel.

Card 1/2

UDC: 620.179.16

L 32702-66

ACC NR: AP6014423

Fig. 1. Schematic of the irradiation.  
 1 - betatron; 2 - specimen;  
 3 - detector collimator,  
 detector block, and crystal-  
 photomultiplier.

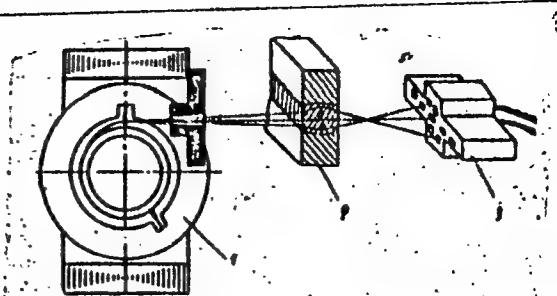
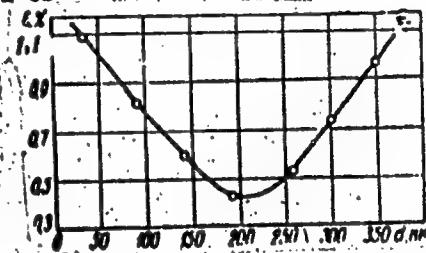


Fig. 2. Dependence of sensitivity on the thickness of the material.  $I = 80 \text{ r/min}$ ;  $E = 30 \text{ Mev}$ ;  $S_k$  (area of collimator) =  $3 \text{ cm}^2$ .



Orig. art. has: 1 table, 4 figures, and 4 equations.

SUB COIE: 11, 13/ SUBM DATE: 02Jul65/ ORIG REF: 002

Card 2/2 BLC

L 02017-67 EWP(c)/EWP(k)/EWT(d)/EWT(m)/T/EWP(l)/EWP(v)/EWP(t)/ETI IJP(c) JD/HW  
ACC NR. AM6005023. (N) Monograph UR/77

Vorob'yev, A. A.; Gorbunov, V. I.; Vorob'yev, V. A.; Titov, G. v. 76

Betatron defectoscopy of materials and products (Betatronnaya defektoskopiya materialov i izdeliy) Moscow, Atomizdat, 65. 0177 p. illus., biblio. 2,000 copies printed. B71

TOPIC TAGS: spectroscopy, spectroscopic analysis, spectrophotometric analysis, beta spectroscopy, beta rays, beta beams, electron density, electron emission, electron detection, electron flaw, electron energy, particle beam

PURPOSE AND COVERAGE: This book describes the principles of exploitation of inductive electron accelerator - betatrons in defectoscopy of plated materials and industrial articles. Different methods of betatron defectoscopy are described, as well as their possibilities and deficiencies. This book is a practical handbook for industrial workers working on problems of defectoscopy of plated materials and other articles, as well as for the candidates and scientists working in the field of defectoscopy.

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UDC:620.179.15+621.384.613

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ACC NR: AM6005023

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31533-66 ENT(a)/EWP(c)/EWP(v)/T/EWP(k)/EWP(h)/EWP(l) IJP(c) GD/BC  
ACC NR: AT6011935

SOURCE CODE: UR/0000/66/000/000/0158/0162

AUTHOR: Gorbunov, V. I. (Tomsk); Makarov, N. Ya. (Tomsk); Cheshev, V. V. (Tomsk); Abramov, V. P. (Tomsk); Voroshen', L. B. (Tomsk)

7-2

71

8+1

ORG: none

TITLE: Automatic quality control of very thick products

SOURCE: Vsesoyuznaya konferentsiya po avtomaticheskому контролю и методам электрических измерений, 5th. Avtomaticheskiy kontrol' i metody elektricheskikh izmereniy; trudy konferentsii, t. 2: Izmeritel'nyye informatsionnyye sistemy. Ustroystva avtomaticheskogo kontrolya. Elektricheskiye izmereniya neelektricheskikh velichin (Automatic control and electrical measuring techniques; transactions of the conference, v. 2: Information measurement systems. Automatic control devices. Electrical measurements of nonelectrical quantities). Novosibirsk, Izd-vo Nauka, 1966, 158-162

TOPIC TAGS: automatic control system, quality control, betatron, x ray apparatus, flaw detector

ABSTRACT: The mass production control of very thick products requires the development of new, more efficient devices for the realization of satisfactory quality control. The present paper describes a BD-1 automated betatron flaw detector, a universal mobile device based on the B-25/10 betatron and presents a detailed outline of its automatic control. The device can carry out continuous plant control of steel products 50-500 mm thick and 0.5 to 8 m long. The

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-ACC NR: AT6011935

test piece may have a complex configuration with a maximum drop in thickness along the irradiation direction of up to 100 mm. Experiments carried out at 25 MeV (radiation intensity 40-60 Roentgen/min) show that flaw detection is no worse than 0.3-1% of the maximum thickness of the sample. The productivity is at least 2 m<sup>2</sup>/hour, the device requires a three-phase a.c. power supply, and it uses no more than 15 kW. The article describes the process of production control, outlines the automatic control system, and the X-ray photography system. Orig. art. has: 3 figures.

SUB CODE: 13,09 SUBM DATE: 29Nov65/ ORIG REF: 003

Card 2/2 2C

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 12, p 194 (USSR) SOV/137-58-12-25461

AUTHOR: Gorbunov, V. I.

TITLE: Exposure Time in the X-raying of Steel With 25-Mev Betatron Rays  
(Prodolzhitel'nost' ekspozitsii pri prosvezhivanii stali rentgenovskimi  
luchami betatrona na 25 Mev)

PERIODICAL: Izv. Tomskogo politekhn. in-ta, 1957, Vol 87, pp 422-430

ABSTRACT: Exposure curves for a darkening density  $D=2$  which were obtained experimentally in photographing steel articles up to 500 mm thick on a betatron with radiation energy of 25 Mev are adduced; 5 types of film were used. In photography with 2FPF3 screens the films range in the following sequence according to sensitivity: Ilford, Agfa-Duro, "Roentgen X-5" and "Roentgen-X". "Roentgen-XX" film can be used expediently with 2P3 screens for thicknesses up to 200 mm only.

P.S.

Card 1/1

*GORBUNOV, V. I.*

SOV/137-58-8-18086D

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 8, p 268 (USSR)

AUTHOR: Gorbunov, V. I.

TITLE: Use of the Betatron in the Detection of Defects in Steel Articles  
(Ispol'zovaniye betatrona v defektoskopii stal'nykh izdeliy)

ABSTRACT: Bibliographic entry on the author's dissertation for the degree  
of Candidate of Technical Sciences, presented to the Tomskiy  
politekhn. in-t (Tomsk Polytechnic Institute), Tomsk, 1958

ASSOCIATION: Tomskiy politekhn. in-t (Tomsk Polytechnic Institute), Tomsk

1. Steel—Inspection 2. Betatrons—Performance

Card 1/1

GORBUNOV, V.I.

Apparatus for measuring various parameters of radiation generated by charged particle accelerators. Izv. vys. ucheb. zav.; fiz. no.3:105-111 '58. (MIRA 11:9)

1. Tomskiy politekhnicheskiy institut imeni S.M. Kirova.  
(Ionization chambers) (Particle accelerators) (X-rays)

21.2100

66545

AUTHORS: Belov, Ye.M., Aspirant, Gorbulov, V.I., Assistant, Cand. of Technical Sciences, Kuznetsov, A.I., Engineer, Titov, V.N., Candidate of Technical Sciences, Docent, and Shipunov, I.V., Chief Engineer of Physicotechnical Dept.

TITLE: A 25 Mev Double-beam Betatron

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Elektromekhanika, 1959, Nr 4, pp 123 - 128 (USSR)

ABSTRACT: The 25 Mev betatron was designed and built by the Tomsk Polytechnical Institute and can be used to obtain a dose of 50-60 roentgens per min at a distance of 1 m. The betatron was first described in Ref 1 and was designed to work off the ordinary 50 cps mains. In order to increase the intensity both half-periods of the sinusoidal accelerating magnetic field were used as well as supply currents at a tripled frequency (150 cps). A 50 kW frequency tripler was especially designed and built by the Institute. In connection with the use of the increased frequency, experiments were carried out in order to choose the type of windings and the cooling system for the

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A 25 Mev Double-beam Betatron

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electromagnet. The results of these experiments and the final form of the electromagnet are now described. The betatron uses a U-shaped magnet whose core is made of sheet steel. The magnet is demountable and consists of two symmetric sections. The two-channel electron injection system, working on 150 cps, is shown in Figure 4. The two-channel synchronization scheme is shown in Figure 6. Other details described include a megavoltmeter, vacuum system and the injector.

There are 8 figures and 5 Soviet references.

ASSOCIATION: Tomskiy politekhnicheskiy institut (Tomsk Polytechnical Institute)

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VOROB'YEV, A.A., prof., doktor fiz.-matem.nauk; GORBUNOV, V.I., kand. tekhn.nauk; TITOV, V.N., dotsent, kand.tekhn.nauk

Using betatrons for radiographic inspection of very thick workpieces. Izv.vys.ucheb.zav.; mashinostr. no.5:195-202 '59. (MIRA 13:4)

1. Tomskiy politekhnicheskiy institut.  
(Betatron) (Testing)

GoldBunin / V.E.

## NAME &amp; BOOK INFORMATION

SOT/255

Moscow. Tekhnicheskaya kniga-izdatelstvo Akademii Nauk SSSR  
 Institut metallovedeniya i poljami  
 Periodicheskaya (Proceedings Alloys) Moscow, Metalloindustria, 1960. 225 p.  
 (Series: I.I. Sovnauk izdat, 77-2) Kratkaia slp inserted. 2,325 copies  
 printed.

Additional Publishing Agency: USSR. Gosudarstvennoye Knizhnoye Izdatelstvo  
 Vses. Radiotekhn.

Eds.: D.I. Gorbunov; M. G. Pashkovskaya Knizhnye: Tekh. Eds.:  
 Ye. B. Tsvetkov.

PURPOSE: This book is intended for engineers and scientists concerned in the  
 metallurgical, instrumental production, and electrical-equipment industries,  
 as well as for industrial personnel engaged in the production of precision  
 alloys. It may also be useful to students attending advanced technical schools.

CONTENTS: The articles in this collection present the results of investigations  
 conducted in recent years by the Central Scientific Research Institute of  
 Ferrous Metallurgy (Centralnyi nauchno-issledovatel'skiy nauchno-tekhnicheskiy  
 magazin), the article deal with theoretical and technical problems of producing soft  
 ferromagnetic alloys, properties and structure of the alloys, extremely low  
 magnetoresistance, the relationship magnetic fields, deformation, annealing,  
 articles are concerned with the properties volume change, etc. Some  
 30 personnel with the same topics of deformed hard magnetic alloys,  
 both ferrous and nonferrous.

EXAMPLES: 1. Effect of Tension on the Thermoelectric  
 Properties of Ferromagnetic

Edchuk, G. I. and T. P. Solodkaya. Bibliometric Investigation of Iron-  
 Carbon Alloys

Solodkaya, T. P. and T. P. Solodkaya. Investigation Between the Ordering  
 Processes and Metallization Processes in Ferro Alloys

Pashkovskaya, G. T. and V. I. Gorbunov. Investigation of the Connection  
 Between Magnetic Properties and Microstructure of Ferromagnetic Alloys

Pashkovskaya, M. G. Structure for Marketing Steel and Plates

Goldbunin, M. A. New Materials for Service at High Temperatures

AVAILABILITY: Library of Congress

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W/7/76  
 7-22-60

242200 1121, 1137, 1164

30669  
8/137/61/000/010/026/056  
A006/A101

AUTHORS: Pshechenkova, G.V., Sorbunov, V.I.

TITLE: Investigating the correlation of magnetic properties and the micro-structure of iron-nickel alloys

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 10, 1961, 22, abstract 10Zh140 ("Sb. tr. Tsentr. n.-i. in-t chernoy metallurgii", 1960, no. 23, 228 - 247)

TEXT: Fe-Ni alloys melted in an induction furnace contained 2-40% Ni. The content of impurities was (in %): C 0.01 - 0.02, Si 0.04 - 0.1, Mn 0.3 - 0.4, Cu 0.2 - 0.25. Specimens for magnetic measurements were manufactured from 3 mm-diameter wire with 80% degree of reduction. During the heating of alloys with 20 - 30% Ni, having a martensite structure after quenching, the  $\alpha \rightarrow \gamma$ -transformation proceeds by two ways: 1) expansion from the grain boundaries in the form of areas with dispersed 2-phase structure; the stability of the  $\gamma$ -phase increases with lower temperature of its formation owing to its higher Ni-content. 2) allotropic transformation within the range between the beginning and completion of the  $\alpha \rightarrow \gamma$ -transformation during heating, occurring very rapidly and

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apparently diffusionless.  $H_c$  of the alloys has a maximum near 28% Ni in quenched alloys and increases as a result of diffusion transformation, accompanied by the formation of the dispersed mixture of 2 phases. There are 6 references. *X*

A. Fedorovskiy

[Abstracter's note: Complete translation]

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S/126/60/010/005/011/030  
E193/E483

AUTHORS: Aptekar', I.L. and Gorbunov, V.I.

TITLE: On the Problem of the Relationship Between Ordering in  
the  $\alpha$ -Phase and the  $\alpha \xrightarrow{\text{?}} \gamma$  Transformation in Fe-Co-V  
Alloys

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol.10, No.5,  
pp.710-713

TEXT: As has been shown by Martin and Geisler (Ref.3), the disorder-order transformation of the  $\alpha$ -phase takes place not only in the binary Fe-Co, but also in the ternary Fe-Co-V alloys. Addition of V lowers the temperature of the disorder-order transformation and yields alloys which at temperatures above 400°C, may consist of two ( $\alpha'$  +  $\gamma$ ) phases. The object of the present investigation was to study the  $\alpha \xrightarrow{\text{?}} \gamma$  transformation during low temperature, isothermal treatment, and to investigate the effect of ordering of the  $\alpha$ -phase on this transformation. Two experimental alloys were used which contained: (1) 51.9% Co, 2.57% V, remainder Fe, and (2) 51.85% Co, 3.14% V, remainder Fe. The ordering transformation was studied by the dilatometric method.

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E193/E483

On the Problem of the Relationship Between Ordering in the  $\alpha$ -Phase  
and the  $\alpha \rightarrow \gamma$  Transformation in Fe-Co-V Alloys

on specimens either quenched, or cooled slowly from 1000°C. In addition, the microstructure and constitution of specimens (a) quenched from 1000°C, (b) slowly cooled from 1000°C and (c) quenched from 1000°C and aged (ordered), were studied by X-ray diffraction and by optical and electron microscopy. The results indicated that, when the alloys studied are subjected to low temperature treatment, ordering of the  $\alpha$ -phase precedes its decomposition and formation of the  $\gamma$ -phase or, to be more exact, that instead of uniform ordering a decomposition, accompanied by the formation of disordered and ordered ( $\alpha + \alpha'$ ) phases, takes place. The volume of the  $\alpha'$ -phase is larger than that of the disorder structure and so is the volume of the vanadium-enriched  $\alpha$ -phase. On further heating, the vanadium-enriched  $\alpha$ -phase undergoes the  $\alpha \rightarrow \gamma$  transformation, as a result of which a highly dispersed  $\alpha' + \gamma$  structure is formed which is similar to the product of decomposition of martensite in these alloys (Ref.3). ✓

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S/126/60/010/005/011/030  
E193/E483

On the Problem of the Relationship Between Ordering in the  $\alpha$ -Phase and the  $\alpha \rightarrow \gamma$  Transformation in Fe-Co-V Alloys

Marked change in the microstructure taking place in the 600 to 700°C interval is obviously associated with the order-disorder transformation taking place in the ordered regions of the  $\alpha$ -phase and it is not unlikely that the increase in volume observed at these temperatures is also caused by these structural changes. There are 4 figures and 4 Non-Soviet references.

ASSOCIATION: Institut pretsizionnykh splavov TsNIIChM  
(Institute of Precision Alloys TsNIIChM)

SUBMITTED: April 3, 1960

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PHASE I BOOK EXPLOITATION

SOV/5832

Anan'yev, L. M., A. A. Vorob'yev, and V. I. Gorbunov

Induktionsnyy uskoritel' elektronov -- betatron (Inductive Accelerators of Electrons -- Betatrons) Moscow, Gosatomizdat, 1961. 349 p. 6000 copies printed.

Ed.: A. F. Alyab'yev; Tech. Ed.: Ye. I. Mazel'.

PURPOSE: This book is intended for students in schools of higher education and for scientific personnel and engineers concerned with nuclear physics and with the design of related machinery and instrumentation.

COVERAGE: The book begins with an explanation of the elementary electron theory of inductive acceleration and the physical processes in a betatron. The design of a betatron installation, its optimum parameters, and the design and calculation of betatron units, e.g., electromagnets, circuit diagrams, vacuum systems, and adjustment elements, are described. Published materials and the authors' experience in the development, construction, adjustment, and use of circular-orbit accelerators.

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## Inductive Accelerators of Electrons (Cont.)

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and betatrons have been systematized and used in the book. No personalities are mentioned. There are 151 references: 83 Soviet, 59 English, and 9 German. References accompany each chapter, except Ch. VII.

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18.9.20025918 S/126/61/012/001/010/020  
E111/E435

AUTHOR: Gorbunov, V.I.

TITLE: Investigation of the structure of irreversible alloys of the Fe-Ni system

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.12, No.1, pp.78-83

TEXT: Iron alloys with up to 25% nickel are single phase after quenching from high temperature and two-phase ( $\alpha + \gamma$ ) in the annealed state starting with about 5% Ni. Their gamma phase supercooled to irreversible-region temperatures does not decompose on prolonged isothermal holding (Ref.4: Allen N.P., Early C.C. J.Iron and Steel Inst., 1950, 166, 281). The object of this work was to elucidate the nature of phase changes leading to the formation of a two-phase structure when iron-nickel alloys with 2 to 25% nickel are slowly cooled from the single-phase gamma-solid-solution temperatures to various temperatures with subsequent quenching. X-ray structural, microscopic (both optical and electron) and dilatometric methods were used. Vacuum photography with monochromatic CoK $\alpha$  radiation and a type KMC $\Pi$  (KMSP) camera (exposures about 30 hours) were used. The electron microscope

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Investigation of the structure ...      E111/E435

was type 9M-3 (EM-3) with a magnification of 4000 followed by three-fold optical magnification. Replicas were of lacquer tinted with chromium. Polished sections were etched in 5% nitric acid. Alloys were induction melted and cast into 2 kg ingots which were forged to 9 mm diameter rods after heating to 1150 to 1200°C in an open gas furnace. These were used for X-ray and microscopic specimens. For dilatometric specimens, the rods were cold-drawn to 3 mm wire. Heat treatment of all specimens was effected in evacuated quartz capsules. They were cooled from 1000°C by water quenching, by allowing to cool in the furnace or at 20°C/hour. The specimens contained under 0.04% C, 0.3 to 0.5% Mn. The authors attribute the observed structural changes to superimposition of processes taking place with and without changes in composition in accordance with the equilibrium diagram and the metastable phase diagram. The author and G.V.Pshechenkova have previously shown (Ref.5: Sb. trudov TsNIIChM, 1960, No.23, p.228) that in tempering in the temperature range of the metastable gamma/alpha region, decomposition of the alpha phase is accompanied by its partial transformation to gamma phase of the same composition. In this range, iron-rich alloys also have, after

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Investigation of the structure ...

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cooling from high temperatures, a  $\gamma$   $\rightarrow$   $\alpha$  transformation without composition change followed by decomposition of the latter during slow cooling or isothermal holding. Thus both the  $\alpha/\gamma$  and  $\gamma/\alpha$  boundaries of the metastable diagram of state correspond to  $\alpha \rightleftarrows \gamma$  transformation without composition change at both low and high temperatures. The formation of a two-phase state during annealing of alloys with less than 11% nickel occurs through an intermediate stage of a rapid lattice-rearrangement process. At high metastable two-phase region temperatures, such as in alloys with under 6% nickel, the composition of the supersaturated alpha phase changes both in decomposition and in diffusional growth. There are 3 figures, 1 table and 5 references: 1 Soviet and 4 non-Soviet. The three references to English language publications read as follows: Bradley A.J., Jay A.H., Taylor A. Phil. Mag., 1937, 23, 545; Owen E.A., Sully A.H. Phil. Mag., 1939, 27, 614; Allen N.P., Early C.C. J. Iron and Steel Inst., 1950, 166, 281. X

ASSOCIATION: Institut pretsizionnykh splavov TsNIIChM  
(Precision Alloys Institute TsNIIChM)

SUBMITTED: October 24, 1960  
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S/126/61/012/004/005/021  
E111/E335

AUTHORS: Gorbunov, V.I. and Livshits, B.G.

TITLE: Investigation of the structure of irreversible alloys  
in the Fe-Co-V system. I. Alloys with a high  
vanadium content

PERIODICAL: Fizika metallov i metallovedeniye, v. 12, no. 4,  
1961, 526 - 533

TEXT: The metastable state of iron-cobalt-vanadium alloys  
has some similarities to that of iron-nickel alloys but both  
metastable transformation and decomposition on isothermal holding  
to form alpha and gamma phases can occur. The present work is  
devoted to a study of the structure of iron-cobalt-vanadium  
alloys with 9 - 15% vanadium and 52% cobalt. The structure of  
the alloys was investigated in non-equilibrium states after  
quenching from the single-phase gamma region followed by iso-  
thermal tempering and after cooling from the same region at  
20 °C/hour to room temperature and to intermediate temperatures  
with subsequent water-quenching. The structure of irreversible  
iron-nickel alloys (10 - 20% nickel) after quenching and  
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isothermal tempering were also studied. X-ray, dilatometric and optical and electronic microscopic methods were used. Alloys were high-frequency induction melted and subjected to hot and cold deformation to obtain rods and wires for preparation of specimens. Polished sections were prepared in the normal way; lacquer replicas were used for electron-microscopy. X-ray diffraction patterns were obtained in monochromatic CrK $\alpha$  radiation, specimens being heat-treated in evacuated quartz capsules. Dilatometric specimens were made from cold-rolled 5-mm diameter wire; curves were obtained at heating rates of 2  $^{\circ}$ C/min. The authors draw the following conclusions: the structure and phase state of the iron-cobalt-vanadium alloys greatly depend on the rate of cooling from the all-gamma solid-solution region. If cooling rates are high (water-quenching), the ordering and decomposition processes in the gamma-phase are suppressed and only the martensite transformation occurs on cooling, its extent depending on the composition. Complete decomposition to give alpha- and gamma-phases, according to the phase diagram, occurs with very slow cooling.

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With intermediate cooling rates partial decomposition and martensite transformation is accompanied by ordering processes in the supercooled gamma phase having the alloy composition. The phase state and structure also change greatly in the tempering of quenched alloys, depending on tempering temperature and vanadium content. Heterogeneous decomposition to form alpha and gamma phases occurs in alloys having martensite structure in the initial state; this is accompanied in high-vanadium alloys by decomposition and ordering of residual austenite. There are, thus, two composition regions, in one of which the gamma-phase separates from alpha and, in the other, alpha from gamma. According to this characteristic, W. Küster and H. Schmid (Ref. 8 - Arch. Eisenhüttenw., 1955, 26, 421) subdivided the two-phase composition region into two regions. However, the present work has shown that the 10-12% vanadium (52% Co) alloys have a tempered structure consisting of precipitates of gamma-phase in alpha matrix and decomposed austenite with precipitates of alpha-phase. Intermediate-region alloys have the highest coercive force after quenching and tempering. The results agree

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